VERMONT
DEPARTMENT OF HEALTH

Cancer Registry
Chronic Disease Epidemiology

Breast Cancer in Vermont

October 2006

Background

Among women, breast cancer is the most commonly diagnosed cancer and a leading cause of cancer deaths in the United States. Nationally breast cancer accounts for 16 percent of all cancer deaths among women, and a woman's risk for developing breast cancer in her lifetime is one in eight. Because breast cancer among males accounts for less than one percent of cancers diagnosed nationally, only female breast cancer is presented in this report.

Breast cancer is a disease in which malignant cells form in the tissues of the breast. A woman's breast is made up of lobules, ducts, fatty and connective tissue, blood vessels, and lymph vessels. Breast cancer can begin in any part of the breast, and if left untreated, can spread to other parts of the body[1].

Vermont Facts, 1999-2003

- **Incidence:** In Vermont, breast cancer is the most common cancer diagnosed in women. Each year, in Vermont, approximately 482 breast cancer cases are diagnosed in women.
- **Mortality:** Breast cancer is the second leading cause of cancer death among Vermont women. Each year in Vermont, approximately 96 women die from breast cancer.
- **Vermont vs. U.S.:** Breast cancer incidence and mortality rates for Vermont women are not significantly different compared to rates for U.S. white women.
- **Yearly Trends:** Breast cancer incidence has not significantly changed in Vermont or the U.S between 1994 and 2003. There was no significant change in female breast cancer mortality in Vermont, but during the same time period, female mortality rates decreased in the U.S.
- **Age:** Incidence of breast cancer increases with age. The majority of breast cancer cases occur in women over age 50.
- **County:** Breast cancer incidence rates for women in Addison and Chittenden Counties are significantly higher than the U.S.
- **Stage:** In Vermont, 65 percent of breast cancers are diagnosed at the localized stage.

[1] The breast cancer data provided in this report are for invasive cases only; in situ (non-invasive) are excluded.

Cancer Incidence and Mortality

Table 1. The five most commonly diagnosed cancers and most common causes of cancer death in females – Vermont, yearly averages 1999-2003.

Cancer Site	Cases (per year)	Percent (per year)
Breast	**482**	**31%**
Lung	176	11%
Colon	173	11%
Uterus	112	7%
Melanoma	80	5%
All Sites	1,538	100%

Cancer Site	Deaths (per year)	Percent (per year)
Lung	139	23%
Breast	**96**	**16%**
Colon & Rectum	70	12%
Pancreas	30	5%
Ovary	29	5%
All Sites	596	100%

New cases per year exclude basal cell and squamous cell skin cancers and in situ (malignant but non-invasive) carcinomas except urinary bladder.

- During 1999-2003, on average, 1,538 women were diagnosed with invasive cancer each year in Vermont. Of those, on average, 482 were cases of breast cancer.
- Breast cancer is the most common cancer diagnosed in women in both Vermont and the United States.
- During 1999-2003, on average 596 women died each year from cancer in Vermont. Of these, on average, 96 deaths were due to breast cancer.
- Breast cancer is the second leading cause of cancer death in Vermont women, accounting for approximately 16 percent of all cancer deaths.

U.S. Comparisons

Table 2. Incidence and mortality rates of breast cancer – Vermont and United States, per 100,000, yearly averages, 1999-2003.

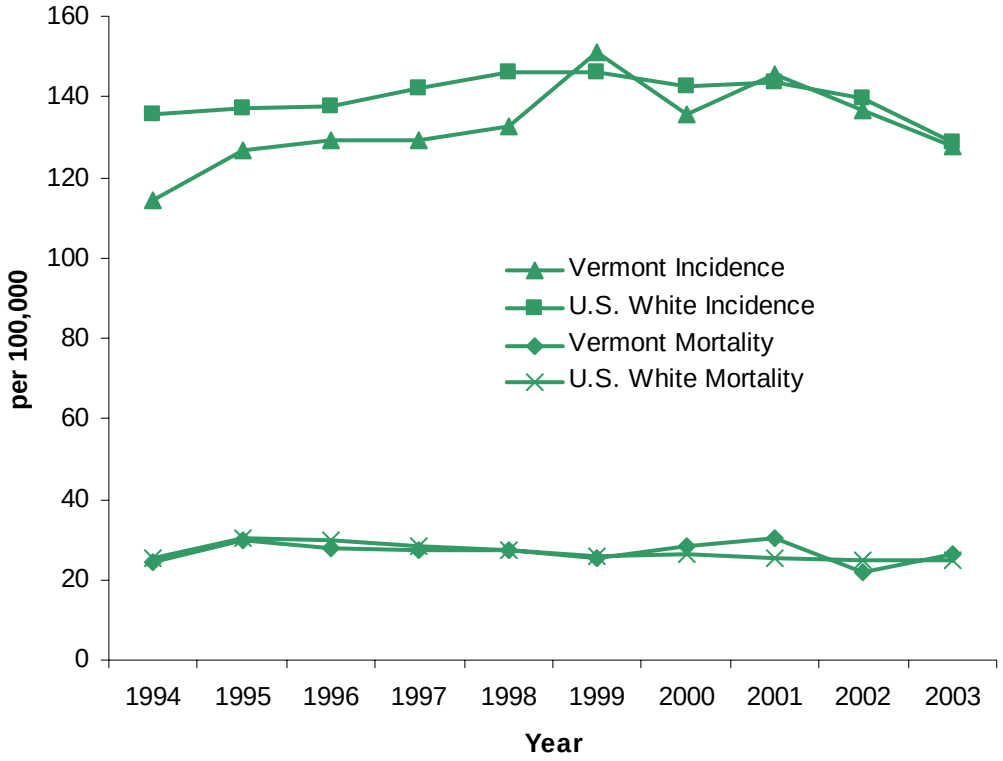
	Incidence	Mortality
VT Females	138.7	26.4
U.S. Females	139.9	25.5

All rates are age-adjusted to the 2000 U.S. standard population. The U.S. mortality rates are based on the Vital Statistics System of the United States Public Use database and are white population mortality rates. The U.S. incidence rates are based on the SEER Cancer Incidence Public Use Database and are white population rates.

- Breast cancer incidence and mortality rates in Vermont women are not significantly different than the U.S. female white rates.

Trends

Figure 1. Incidence and mortality rates of breast cancer – Vermont and United States, 1994-2003.

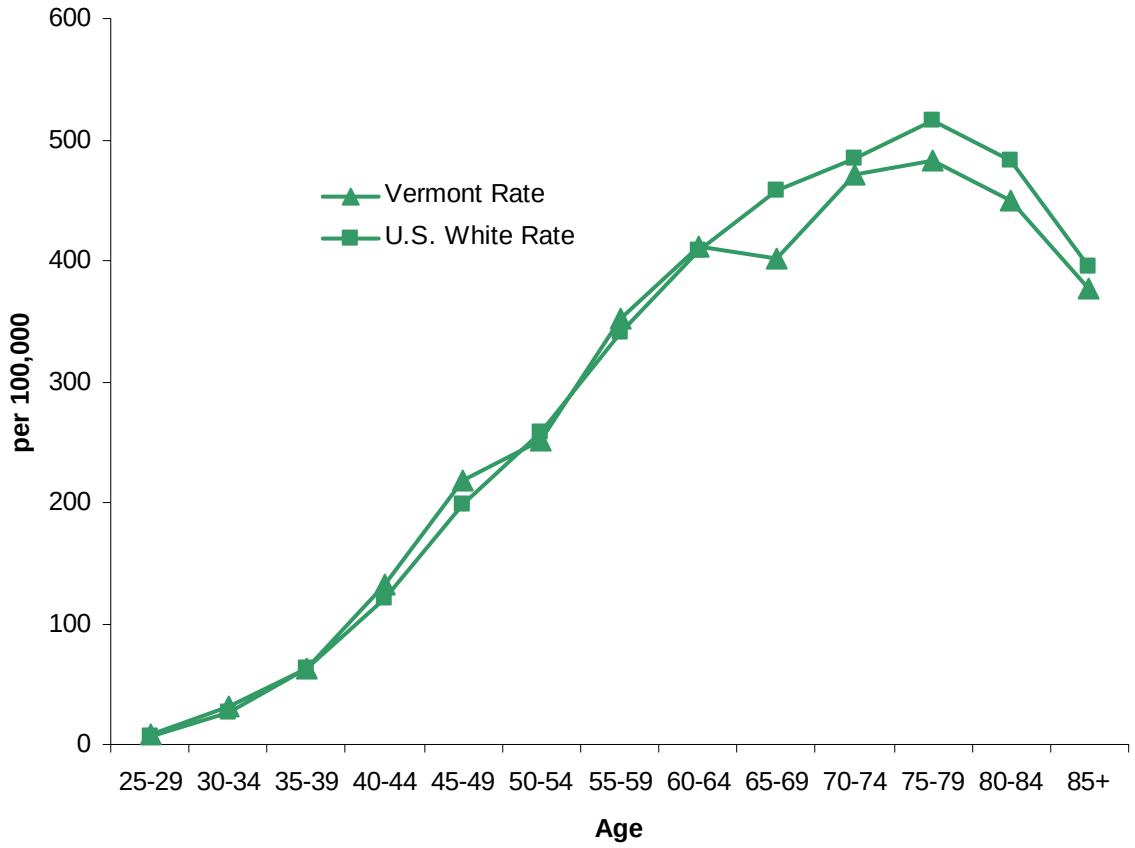


All rates are age-adjusted to the 2000 U.S. Standard population. The U.S. mortality rates are based on the Vital Statistics System of the United States Public Use database and are white population mortality rates. The U.S. incidence rates are based on the SEER Cancer Incidence Public Use Database and are white population rates.

- From 1994 to 2003, trend analysis shows that there was no significant change in female breast cancer incidence in Vermont or the U.S.
- From 1994 to 2003, trend analysis shows that there was no significant change in female breast cancer mortality in Vermont, but during the same time period, female mortality rates decreased in the U.S.

Age

Figure 2. Incidence rates of breast cancer, by age – Vermont and United States, 1999-2003.



Age Group	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+
VT Rate	8.2	30.6	62.1	132.2	217.7	251.4	351.3	410.9	402.2	471.3	482.5	449.5	376.9
U.S. Rate	7.3	26.0	62.0	121.1	198.1	258.1	340.6	408.3	458.3	483.7	515.9	482.0	394.3

All rates are age-adjusted to the 2000 U.S. standard population. The U.S. incidence rates are based on the SEER Cancer Incidence Public Use Database and are white population rates. From 1999-2003, there were too few cases of breast cancer in Vermonters younger than 25 years old to report. Because of the small number of cases in each age group and gender, these data are not presented. Rates are only presented when the number of cases in a particular age group is at least 6.

- The incidence of breast cancer, as with many cancers, is extremely low in childhood and increases dramatically with age. Breast cancer is most often found in women over the age of 50.
- Vermont women age 75-79 have the highest age-specific incidence of breast cancer, at a rate of 482.5 per 100,000.
- There are no significant differences in age-specific incidence rates of breast cancer compared to the U.S.

County Rates

Table 3. Incidence and mortality rates of breast cancer – Vermont by county, per 100,000, 1999-2003.

County	Incidence		Mortality
Addison	166.9	*	23.7
Bennington	125.9		25.1
Caledonia	133.6		33.5
Chittenden	152.7	*	28.6
Essex	127.7		^
Franklin	129.5		29.1
Grand Isle	110.6		^
Lamoille	142.0		34.9
Orange	137.8		^
Orleans	120.6		27.2
Rutland	128.0		20.8
Washington	138.9		25.6
Windham	127.2		32.7
Windsor	144.4		23.9

All rates are age-adjusted to the 2000 U.S. standard population.

** Statistically higher than the U.S.*
^ Numbers too small for mortality rate calculation.

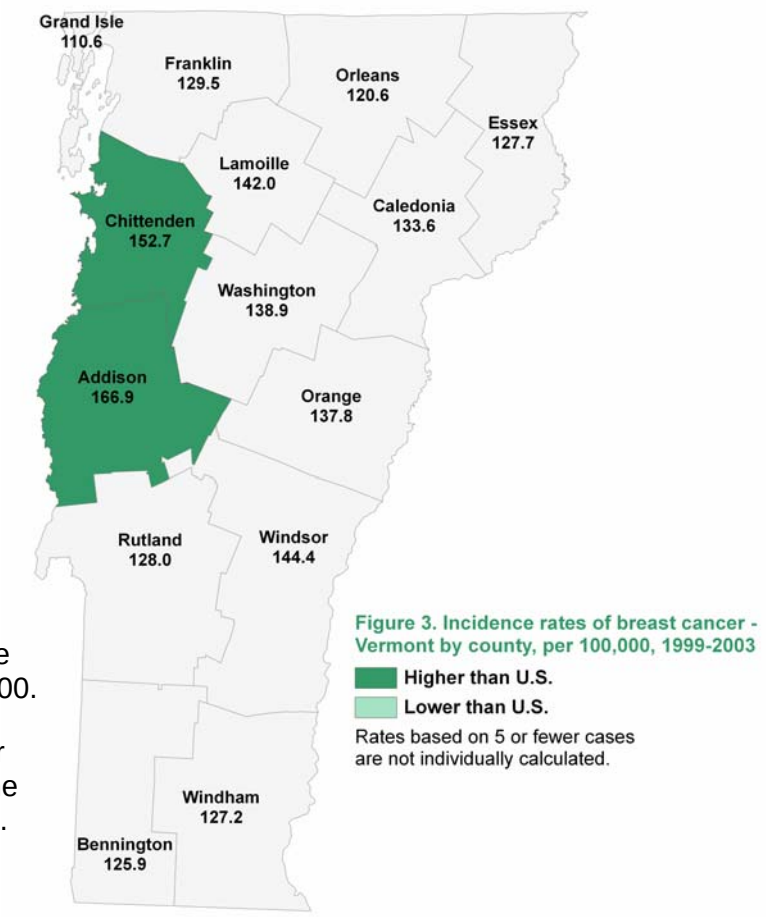


Figure 3. Incidence rates of breast cancer - Vermont by county, per 100,000, 1999-2003

- The breast cancer incidence rates in Addison and Chittenden Counties are significantly higher than the U.S. female white incidence rate of 139.9 per 100,000.
- There are no significant differences in breast cancer mortality rates by county in Vermont compared to the U.S. female white mortality rate of 25.5 per 100,000.

Risk Factors

The exact cause of breast cancer or why one women develops this disease and another does not is not well understood. While many factors have been associated with breast cancer, most only relate to a moderate increase in risk. This suggests that multiple factors may play a role in each woman's disease and that unrecognized factors may exist.

The following are some factors that have been shown to elevate a woman's risk of developing breast cancer:

- **Age:** Breast cancer incidence increases with age, but breast cancer tends to be more aggressive when it occurs in younger women. Nationally, most women who get breast cancer are over age 50. Women over age 60 are at greatest risk for developing breast cancer.
- **Hormonal Factors:** Women who began menstruation, before 12 years old, or who began menopause after age 55 have an increased risk of developing breast cancer. Other risk factors include: the use of menopausal hormone therapy drugs for five or more years; having a first child after the age of 35; never

breastfeeding; or never bearing children. Studies have shown no link between abortion or miscarriage and breast cancer.

- **Family History and Genetics:** Women who have had breast cancer or have a mother, sister, or daughter with breast cancer, have an increased risk of developing it themselves. A woman with breast cancer in one breast possibly will have an increased risk of developing a new cancer in the other breast or in another part of the same breast (separate from a reoccurrence). Women who inherit specific genes are at a greater risk for developing breast cancer. These genes include BRCA1 and BRCA2, which have been linked to the rare familial form of breast cancer.

- **Race:** Breast cancer is diagnosed more frequently in white women than Latina, Asian, or African American women.

- **Diet and Lifestyle:** Diet is being studied as a risk factor for breast cancer. Women are more likely to die of breast cancer if they consume a diet high in fat. Other lifestyle factors that can increase risk include: postmenopausal weight gain; physical inactivity; and alcohol consumption. Being active may help reduce risk by preventing weight gain and obesity.

Prevention and Screening

Currently, there is no known way to prevent breast cancer, only ways to reduce a person's risk. A woman may reduce her risk for breast cancer by altering those risk factors that can be changed. It is not known if a diet low in fat will prevent breast cancer. Exercise, especially in young women, may decrease hormone levels and contribute to a decreased breast cancer risk. Breast feeding may also decrease a woman's risk of breast cancer.

Early detection is the goal of breast cancer screening. If breast cancer is diagnosed at an earlier stage, the chances for survival are greater. Mammography, combined with a clinical breast exam, remains the most effective means of early detection. It is recommended that women have a mammogram, with or without clinical breast examination (CBE), every 1-2 years beginning at age 40.

As part of the Healthy Vermonters 2010 objectives, Vermont set a goal to increase the percentage of women (age 40+) who have had a mammogram at least every two years to 70 percent. Approximately 77 percent of Vermont women 40 and older had a mammogram in the preceding two years. Vermont has met the Healthy Vermonters goal of 70 percent since 1998. Vermonters Taking Action Against Cancer[2] has established a revised 2010 Objective of 85 percent.

Data from the Behavioral Risk Factor Surveillance System indicates that certain subgroups are less likely to have had a mammogram:

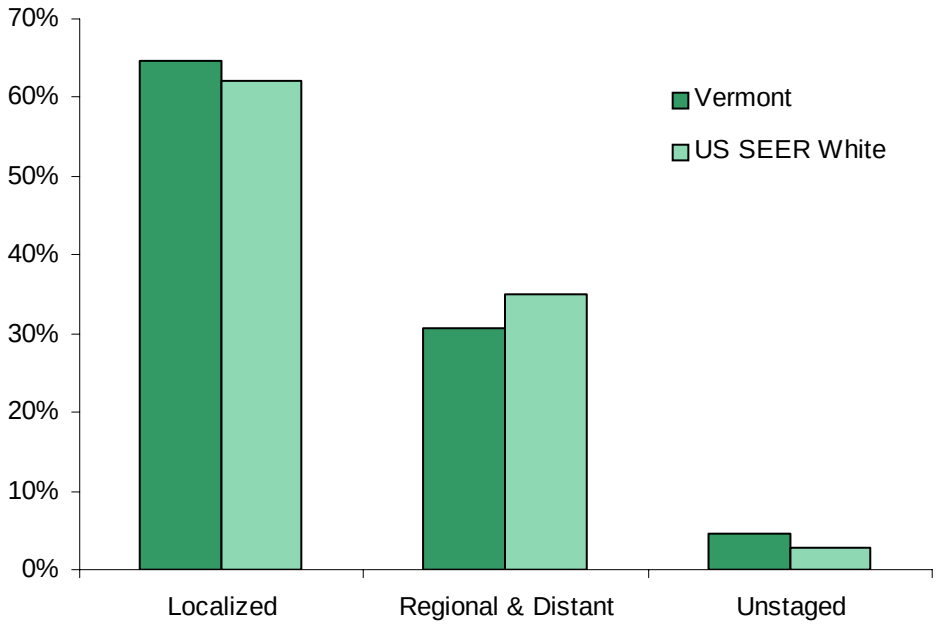
- **Without health insurance:** 58 percent (compared to 79 percent).
- **Without personal doctor:** 39 percent (compared to 80 percent).
- **Education less than high school:** 71 percent (compared to 82 percent with college or higher).
- **Income at or below 125 percent of the Federal Poverty Level:** 66 percent (compared to 86 percent at FPL 500 percent or higher).

[2] VTAAC is a statewide partnership of more than 150 individuals, professionals and organizations working together to reduce the impact of cancer on all Vermonters. A comprehensive strategic plan addressing prevention, detection, treatment, survivorship needs, and palliative care related to Vermont's leading cancers is available at http://healthvermont.gov/cancer or call (802) 865-7706.

Stage at Diagnosis

Nationally, 98 percent of women diagnosed at a localized stage survive their breast cancers for at least five years. Only 27 percent of women diagnosed with distant stage breast cancer survive for at least five years.

Figure 4. Distribution of breast cancer cases by stage at diagnosis – Vermont and the United States, 1999-2003.



Data only include malignant, invasive, breast cancer cases. Staging categories for regional and distant stages are combined due to coding changes that occurred with cases diagnosed 2001 and forward.

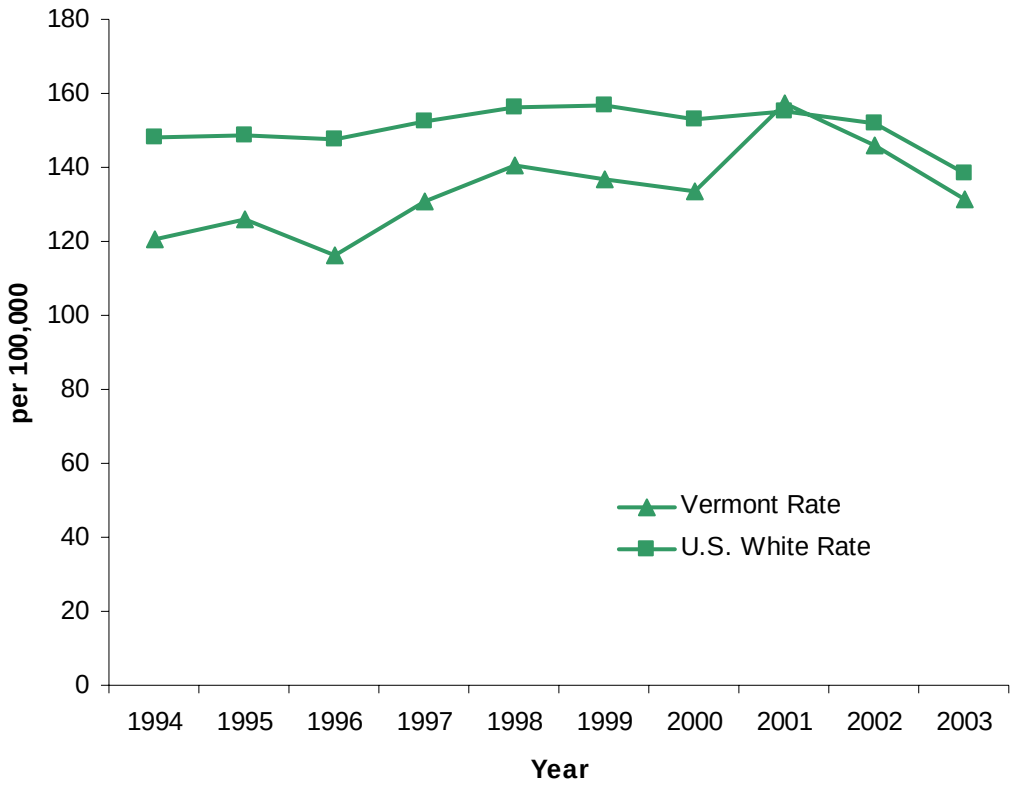
- Sixty-five percent of breast cancers are diagnosed among Vermont women at the early (localized) stage, which is significantly higher than the U.S. proportion of 62 percent of breast cancers diagnosed at the early stage.

- Thirty percent of breast cancers are diagnosed at a late (regional or distant) stage among Vermont women. This is significantly lower, compared to 35 percent of breast cancers diagnosed at the late stage among U.S. white women.

Advanced Stage Diagnosis

The rate of cases of cancer that are diagnosed at late or advanced stages is a measure of the effectiveness of cancer screening efforts.

Figure 5. Incidence rates of advanced stage breast cancer, women age 40+ - Vermont and the United States, 1994-2003



Advanced stage breast cancer includes diagnosis of regional or distant stage, or local stage with tumor size greater than 2cm.

- Among Vermont women the rate of breast cancer incidence per 100,000 women age 40 and older diagnosed at advanced stage (regional, distant stage or local stage with tumor size greater than 2cm) has increased over the past decade.

- However, during the last five years, the rates for Vermont and the U.S. are similar and using trend analysis; the rate did not significantly change for Vermont or the U.S. during this five year time period.

Ladies First Program

The Ladies First program is partially funded by the Centers for Disease Control (CDC)[3] to: screen women for breast and cervical cancers; provide appropriate referrals for medical treatment (case management); develop and disseminate public information and education programs; improve education, training and skills of health professionals; monitor quality of screening procedures; and evaluate activities. Through the CDC cooperative agreement, Ladies First pays for annual mammograms, clinical breast exams, pelvic exams, Pap tests, instruction in breast self-exam, and cardiovascular disease risk factor (cholesterol, high blood pressure, diabetes) screening for eligible women. Services are provided locally, by the woman's own physician, in most cases. Ladies First also pays for repeat mammograms, ultrasounds, biopsies, and colposcopies.

Early and regular screening is essential to reducing the death rate from cancer and heart disease. Women who have limited income are less likely to be screened for cancer and heart disease. Breast and cervical cancer mortality occurs disproportionately among women of racial and ethnic minority and limited income groups.

Between July 2000 and June 2005:

- The Ladies First Program provided CDC-funded breast cancer screening to 3,084 Vermont women.
- 597 CDC-funded mammograms were abnormal requiring additional diagnostic services.
- 45 women were diagnosed with breast cancer.

Health care providers are another critical element of the Blueprint for Health[4] and are the point of entry for Ladies First members to receive breast and cervical cancer screening. The Ladies First Program ensures reimbursement for provided services and referral to appropriate treatment. In addition, all women who have been screened through Ladies First that need treatment for breast and cervical cancer may be eligible for full Medicaid benefits during treatment, including coverage for pre-malignant conditions (through the Breast and Cervical Cancer Treatment Act). To date, there are 1,008 health care providers that provide screening services for Ladies First members.

[3] Ladies First also receives grant funding from The Susan G. Komen Breast Cancer Foundation. The screening data in this section of the report do not currently take into consideration screening provided by this non-CDC funding. Komen funding support is critical to the Ladies First program. The funding increases the programs capacity to screen women less 50 years of age.

[4] Vermont's response to the challenge of chronic conditions is embodied in the Vermont Blueprint for Health, a collaborative project begun in the fall of 2003 and led by a public-private partnership that includes state government, health insurance plans, business and community leaders, health care providers, and consumers. For more information visit: http://healthvermont.gov/blueprint.aspx.

Data Sources

Vermont Cancer Registry: The Vermont Cancer Registry is a central bank of information on all cancer cases diagnosed or treated in Vermont since January 1, 1994. The registry enables the state to collect information on new cases (incidence) of cancer. Previously, the state only kept records on deaths from cancer. The information maintained by the registry allows the Health Department to study cancer trends and improve cancer education and prevention efforts. Suggested Citation: Vermont Department of Health Cancer Registry, 1999-2003. The Vermont Cancer Registry can be contacted at 802-865-7749.

Vermont Vital Statistics: In Vermont, towns are required to file certified copies of death certificates with the Department of Health for all deaths occurring in their jurisdictions. The Health Department is responsible for maintaining the vital statistics system. Suggested Citation: VT Department of Health Vital Statistics System, 1999-2003.

Behavioral Risk Factor Surveillance System: Since 1990, Vermont and 49 other states and three territories track risk behaviors using a telephone survey of adults called the Behavioral Risk Factor Survey. Suggested Citation: Centers for Disease Control and Prevention (CDC). Behavioral Risk Factor Surveillance System Survey Data. Atlanta, Georgia: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, 2005.

Ladies First: Centers for Disease Control and Prevention, National Breast and Cervical Cancer Early Detection Program, "Women Served through the NBCCEDP Five-Year Summary, 7/2000 to 6/2005, Vermont," http://www.cdc.gov/cancer/nbccedp/data/summaries/vermont.htm. Accessed October 11, 2006.

Surveillance, Epidemiology, and End Results: The National Cancer Institute funds a network of Surveillance, Epidemiology and End Results (SEER) registries. The SEER Program currently collects and publishes cancer incidence and survival data from 14 population-based cancer registries and three supplemental registries covering approximately 26 percent of the U.S. population. These rates are used to estimate the U.S. cancer incidence rates. U.S. incidence is based on the SEER 9 Registries white rates. Suggested Citation: Ries LAG, Eisner MP, Kosary CL, Hankey BF, Miller BA, Clegg L, Mariotto A, Feuer EJ, Edwards BK (eds). SEER Cancer Statistics Review, 1975-2003, National Cancer Institute. Bethesda, MD, 2006. http://www.seer.cancer.gov/csr/1975_2003

U.S. Vital Statistics: The U.S. Public Use Database Vital Statistical System maintains the U.S. mortality rates. Rates presented in this report are for the U.S. white population and were obtained using CDC Wonder. Suggested Citation: United States Department of Health and Human Services (U.S. DHHS), Centers for Disease Control and Prevention (CDC), National Center for Health Statistics (NCHS), Office of Analysis, Epidemiology, and Health Promotion (OAEHP), Compressed Mortality File (CMF) compiled from CMF 1968-1988, Series 20, No. 2A 2000, CMF 1989-1998, Series 20, No. 2E 2003 and CMF 1999-2003, Series 20, No. 2G 2004 on CDC WONDER On-line Database.

Technical Notes and Definitions

Age Adjustment: All rates in this document are age-adjusted to the 2000 U.S. standard population. This allows the comparison of rates among populations having different age distributions by standardizing the age-specific rates in each population to one standard population.

Incidence: Incidence refers to the number or rate of newly diagnosed cases of cancer. The incidence rate is calculated as the number of new female breast cancers diagnosed in the state during one year divided by the number of female residents in the state during the same year. The incidence data presented in this report were coded using the International Classification of Disease for Oncology (ICD-O) coding system. Breast cancer cases were defined as invasive neoplasms with ICD-O-3 codes

of C50.0-C50.9 with the exception of histologies 9590-9989 (or equivalent for older data).

Mortality: Mortality refers to the number or rate of deaths from cancer. The mortality data presented here were coded using the International Classification of Diseases (ICD). From 1999 on, cancer mortality site groupings are defined by NCHS and based on ICD-10 classification.

Race: U.S. incidence and mortality rates for whites, rather than those for all races, are used for comparison because racial minority groups were estimated to make up 3.1 percent of the total Vermont population, compared with the total U.S. non-white population of 19.6 percent in 2004. Nationwide, whites have a higher risk compared to people of other races for female breast, melanoma, and bladder cancer incidence. Whites have a lower risk compared to other races for prostate, colorectal, and cervical cancer. The much smaller populations of Vermont residents of other races may have very different risks of these cancers. Combining data over many years will be required to determine cancer rates.

Federal Poverty Level (FPL): The set minimum amount of income that a family needs for food, clothing, transportation, shelter and other necessities. In the United States, this level is determined by the Department of Health and Human Services. FPL varies according to family size. The number is adjusted for inflation and reported annually in the form of poverty guidelines. Public assistance programs, such as Medicaid in the U.S., define eligibility income limits as some percentage of FPL.

Confidence Intervals: A confidence interval is a range of values within which the true rate is expected to fall. If the confidence intervals of two groups (such as males and females, or Vermont and the U.S.) overlap, then any difference between the two rates is not statistically significant. All rates in this report are calculated at a 95 percent confidence level. For example, the age adjusted Vermont male cancer incidence rate is 580.9 *(567.8, 594.2)* per 100,000 and the Vermont female cancer incidence rate is 446.8 *(436.7, 457.0)*. Since the Vermont female confidence interval and the Vermont male confidence interval do not overlap, a statistical difference exists between the two rates.

Small Numbers: Rates are not presented in this report if they are based on fewer than 6 cases.

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Vermonters Taking Action Against Cancer (VTAAC)

VTAAC is a statewide partnership of more than 150 individuals, professionals and organizations working together to reduce the impact of cancer on all Vermonters. A comprehensive strategic plan addressing prevention, detection, treatment, survivorship needs, and palliative care related to Vermont's leading cancers is available at http://healthvermont.gov/cancer or call (802) 865-7706.

Ladies First

For membership and eligibility information visit http://healthvermont.gov/prevent/ladies_first.aspx or contact Ladies First at 1-800-508-2222.